IN THE CLAIMS:

Please cancel, without prejudice, claims 72-74, add the following new claims 83-100, and amend the other claims as follows:

42. (Presently amended) A method of ~~regulating the~~ controlling the actual value of the rotation ~~speed~~ frequency of a motor having a digital rotation ~~speed~~ frequency controller associated therewith, ~~which~~ so that said motor will run at a target rotation frequency having a predetermined mathematical relationship to a target frequency supplied to said controller, ~~during operation, furnishes an actual value signal for the rotation speed, in the form of a rotation speed frequency signal, toward a target rotation speed,~~

comprising executing repeatedly, in an arbitrary sequence, the two steps of:

in a first time segment, having a length determined by events of the rotation frequency, obtaining, from the actual value of the rotation ~~speed~~ frequency signal, a first numerical frequency value ~~that characterizes~~ characterizing the rotation frequency ~~speed~~ of the motor;

in a second time segment, having a length determined by events of the target frequency and overlapping the first time segment, ~~that is substantially simultaneous with the first time segment,~~ obtaining, from said a target ~~value~~ frequency ~~signal~~, a second numerical frequency value ~~that characterizes~~ characterizing the frequency thereof; ~~of the target value frequency signal; and~~

followed by the step of, by means of the first and second numerical frequency values, ~~regulating~~ controlling, using the digital speed controller, the rotation frequency ~~speed~~ of the motor toward ~~a~~ said target rotation frequency having a predetermined mathematical relationship to the target frequency. ~~speed that is associated with the target value frequency signal according to a predefined mathematical relationship.~~

43. (Presently amended) The method according to claim 42, further comprising,

in order to obtain said first and second numerical ~~frequency~~ values, measuring the length of the first time segment and the length of the second time segment overlapping the first time segment. ~~a time interval between defined events of the respective frequency signal.~~

44. (Presently amended) The method according to claim 43, wherein

~~said time interval~~ the measuring of the first time segment and the measuring of the second time segment comprises~~s~~ measuring a time interval between edges of the respective frequency signal.

45. (Presently amended) The method according to claim 43, further comprising

using an identical time standard for time measurement for obtaining the first numerical ~~frequency~~ value and for time measurement for obtaining the second numerical ~~frequency~~ value.

46. (Presently amended) The method according to claim 42 ~~43~~, of ~~measuring~~ determining a numerical value for the frequency of a frequency signal which, at a constant frequency, comprises a fixed number of events per unit time, said events being selected from the group consisting of signal pulses and signal edges,

comprising the steps of:

a) at a first predetermined instant, initiating measurement of a frequency datum;

b) ascertaining a second instant, at which an event of the frequency signal subsequent to the first predetermined instant occurs;

c) counting the number of events of the frequency signal subsequent to the second instant;

d) at a third predetermined instant, initiating termination of measurement of the frequency datum;

e) ascertaining a fourth instant, at which an event of the frequency signal subsequent to the third predetermined instant occurs; and

f) calculating the numerical value ~~frequency datum~~ from the time interval between the second instant and fourth instant, and from the number of events of the frequency signal counted between said instants.

47. (Original) The method according to claim 46, wherein

said step of ascertaining the fourth instant comprises using the next event of the frequency signal as the event subsequent to the third predetermined instant.

48. (Original) The method according to claim 46, further comprising, for ascertaining the fourth instant, selecting, as the event subsequent to the third predetermined instant, that next event of the frequency signal at which the number of events since the second instant is equal to a product a * N, where a and N are whole numbers, of which one is equal to at least 1 and the other is equal to at least 2.

49. (Original) The method according to claim 48, wherein, in the case of a rotation speed frequency signal (f), the number N corresponds to a fixed number of events per revolution of the rotor.

50. (Presently amended) The method according to claim 46, further comprising continuously measuring said first and second numerical ~~frequency~~ values.

51. (Original) The method according to claim 50, wherein the first predetermined instants of successive measurements have defined time offsets (T_A); and

wherein the third predetermined instants each have a substantially constant time offset from the associated first predetermined instants.

52. (Original) The method according to claim 50, wherein the third predetermined instant of a first measurement corresponds to the first predetermined instant of a second measurement subsequent thereto.

53. (Original) The method according to claim 52, wherein the fourth instant of a first measurement corresponds to the second instant of a second measurement subsequent thereto.

54. (Presently amended) The method according to claim 46, further comprising

calculating said numerical value ~~a frequency datum~~ by dividing the number (N) of events of the frequency signal between the second and fourth instants by the time interval ($\Delta t$) between said second and fourth instants.

55. (Presently amended) The method according to claim 54, further comprising the step of multiplying the ~~rotation speed datum~~ numerical value by multiplication with a constant factor.

56. (Presently amended) The method according to claim 55, further comprising selecting the constant factor such that the ~~rotation speed datum~~ numerical value substantially corresponds to a conventional rotation speed indication.

57. (Original) The method according to claim 54, further comprising dividing a numerator proportional to the number of pulses between the second and fourth instants by a denominator proportional to the time interval between the second and fourth instants, obtaining, as a result, an integral frequency datum and a remainder; and

using the remainder by adding it to the numerator of the subsequent measurement.

58. (Presently amended) A method of obtaining a <u>numerical value</u> ~~datum~~ concerning the rotation speed of a rotor, according to claim 46, further comprising the steps of:

a) during a first measurement period (T_M1), counting the number (N) of events of the rotation speed signal (f);

b) measuring the time duration ($\Delta t$) of the first measurement period (T_M1);

c) performing an integral division ("div") in which the number of events during the first measurement period (T_M1) is the numerator and the time duration of the first measurement period (T_M1) is the denominator, thereby obtaining a first integral rotation speed <u>numerical value</u> ~~datum~~ and a remainder (S372; S472); and

d) during a subsequent measurement, adding said remainder (REM_n_OLD; REM_n_s_OLD) to the numerator in a subsequent integral division forming part of said subsequent measurement.

59. (Original) The method according to claim 58, wherein the number (N) of events prior to the integral division (S372; S472) is multiplied by a constant factor that is greater than 1, in order to obtain a result of the integral division that is large in relation to the remainder (REM_n; REM_n_s).

60. (Original) The method according to claim 59, wherein the constant factor is a power of two ($2^h$; $2^{h\_s}$).

61. (Original) The method according to claim 60, wherein the exponent (h; h_s) of the power of two is an adjustable variable.

62. (Presently amended) An apparatus comprising ~~for regulating rotation speed in a device~~ a motor having a rotor, ~~comprising~~

a sensor (61) which furnishes a ~~rotation speed~~ motor frequency signal (f) having a frequency defined by the rotation speed of said rotor and providing ~~indicating~~ a defined number of events for each revolution of the rotor,

a digital rotation speed controller associated with said motor for controlling the rotation frequency thereof;

first input means for supplying the motor frequency signal to said digital controller;

second input means for supplying a target frequency to said digital controller;

said digital controller having a program associated therewith for controlling said rotation speed toward a target rotation speed having a predetermined mathematical relationship to said target frequency, said program being adapted for repeatedly executing, in an arbitrary sequence, the two steps of

in a first time segment, having a length determined by events of the motor frequency signal, obtaining from said signal a first numerical value characterizing the actual rotation speed of the motor,

in a second time segment, having a length determined by events of the target frequency and overlapping the first time segment, obtaining, from said target frequency, a second numerical value characterizing the target frequency;

followed by the step of, by means of said first and second numerical values, controlling, using the digital speed controller, the rotation speed of the motor toward said target rotation speed having a predetermined mathematical relationship to said target frequency.

(CANCELLED END PORTION OF CLAIM 62)

~~a source (23) of control signals,~~

~~a counter (INT_CNT_f) which counts events indicated by the rotation speed signal (f); and~~

~~a program controlled apparatus (23) for analyzing the aforesaid signals by executing the following steps:~~

~~a) initiating measurement of a rotation speed datum in response to a first control signal;~~

~~b) ascertaining a first instant, at which an event of the rotation speed signal (f) subsequent to the first control signal occurs;~~

~~c) counting the number of subsequent events of the rotation speed signal (f) in the counter (INT_CNT_f) for events of the rotation speed signal (f);~~

~~d) initiating termination of measurement of the rotation speed datum in response to a second control signal;~~

~~e) ascertaining a second instant, at which an event of the rotation speed signal (f) subsequent to the second control signal occurs;~~

~~f) calculating a rotation speed datum from the time interval (Δt_MEAS_f(175-177)) between the first instant (161) and second instant (163), and from the number (N) of events of the rotation speed signal (f) between said two instants; and~~

~~g) using the thus calculated rotation speed datum in regulating rotation speed.~~

PLEASE ADD THE FOLLOWING NEW CLAIM:

100. (NEW) An apparatus according to claim 62 which performs the steps of:

a) initiating measurement of the first numerical value in response to a first control signal;

b) ascertaining a first instant, at which an event of the rotation speed signal (f) subsequent to the first control signal occurs;

c) counting the number of events of the rotation speed signal (f) subsequent to said first instant;

d) initiating termination of measurement of the first numerical value in response to a second control signal;

e) ascertaining a second instant, at which an event of the rotation speed signal (f) subsequent to the second control signal occurs;

f) calculating said first numerical value from the time interval (Δt_MEAS_f(175-177)) between the first instant (161) and the second instant (163), and from the number (N) of events of the rotation speed signal (f) between said two instants; and

g) using the thus-calculated numerical value in controlling rotation speed.

63. (Presently amended) The apparatus according to claim ~~62~~ 100, wherein the source of the control signals comprises a timer (TIMERØ).

64. (Original) The apparatus according to claim 63, wherein the timer (TIMERØ) is configured so as to trigger interrupt operations (TIMERØ Interrupt) as control signals.

65. (Presently amended) The apparatus according to claim ~~62~~ 100, further comprising a timer (TIMER1) ~~which measures~~ for measuring time elapsed between the first and second instants.

66. (Presently amended) The apparatus according to claim 65, wherein the timer (TIMER1) ~~which measures~~ for measuring the time between the first and second instants is ~~configured as~~ a ring counter.

67. (Presently amended) The apparatus according to claim 66, wherein

the ring counter (TIMER1), in operation, counts continuously, and the end of a completed measurement is substantially contemporaneous with the beginning of a new measurement.

68. (Presently amended) The apparatus according to claim 62, wherein a signal from an electronically commutated motor serves as the ~~rotation speed~~ motor frequency signal (f).

69. (Presently amended) The apparatus according to claim 62, wherein a counter (INT_CNT_f) for events of the ~~rotation speed~~ motor frequency signal (f) is provided. ~~in the program-controlled apparatus (23).~~

70. (Presently amended) An apparatus according to claim 62, wherein said ~~program-controlled~~ apparatus responds to application of a target value frequency of zero by regulating rotation speed to zero.

71. (Presently amended) The apparatus according to claim 62, wherein a single timer (TIMERØ) is provided for both measuring the length (Δt_MEAS_f) of the first time segment and measuring the length (Δt_MEAS_f_s) of the second time segment. ~~A method of controlling the rotation speed of a motor which has a rotor and a rotation speed controller, comprising the steps of~~

~~generating a rotation speed frequency signal (f) having a frequency proportional to the rotation speed of the rotor;~~

~~generating a target value frequency signal (f_s); and controlling the rotation speed of the rotor in such a way that the frequency of the rotation speed frequency signal (f) and the frequency of the target value frequency signal (f_s) are at a defined ratio (y/z) to one another.~~

72. (Cancelled) The method according to claim 71, wherein the ratio between the frequencies (f) and (f_s) is influenced by at least one parameter.

73. (Cancelled) The method according to claim 72, wherein the ratio between the frequencies (f) and (f_s) is defined in the controller by means of at least one parameter (X; Y).

74. (Cancelled) The method according to claim 73, further comprising

the step of storing the at least one parameter in a nonvolatile memory.

75. (Presently amended) A method of ascertaining a plurality of numerical values characterizing the frequencies of ~~frequency based upon~~ a plurality of sensed signals (f; ~~and~~ f_s), said signals ~~indicating~~ each comprising a sequence of events selected from the group consisting of signal pulses and signal edges, comprising the steps of:

a) for at least two of said signals, initiating measurement of their ~~frequency~~ associated numerical value at a first predetermined instant;

b) for each of said signals, ascertaining a second instant, at which a frequency datum of said signal subsequent to the first predetermined instant occurs;

c) separately sensing the number of events of each of said signals subsequent to the second instant;

d) at a third predetermined instant, initiating termination of measurement ~~of the frequency~~ of said signals;

e) for each of said signals, separately ascertaining a fourth instant, at which a frequency datum of said signal subsequent to the third predetermined instant occurs;

f) from the time interval between the respective second instant and the respective fourth instant, and from the number of frequency data of the respective signal between said respective instants, calculating, for each of said signals, ~~a magnitude~~ the numerical value characterizing its frequency.

76. (Presently amended) The method according to claim 75, further comprising, in order to ascertain the <u>respective</u> fourth instant,

selecting the next frequency datum of the <u>respective</u> signal as the frequency datum subsequent to the third predetermined instant.

77. (Presently amended) The method according to claim 75, further comprising, in order to ascertain the <u>respective</u> fourth instant, selecting, as the frequency datum subsequent to the third predetermined instant, that next frequency datum of the <u>respective</u> signal at which the number of frequency data since the second instant corresponds to an integral multiple of a whole number from the series 2, 3, 4, ...

78. (Original) The method according to claim 75, wherein frequency measurements are performed continuously and the third predetermined instants each have a substantially constant time offset (T_A) from the associated first predetermined instants.

79. (Original) The method according to claim 78, wherein the third predetermined instant of the measurement of a signal corresponds to the first predetermined instant of a subsequent measurement.

80. (Original) The method according to claim 78, wherein the fourth instant of a measurement corresponds to the second instant of a subsequent measurement of the same signal.

81. (Original) The method according to claim 75, wherein the first predetermined instants, for initiating measurement of the plurality of signals, are substantially identical to each other.

82. (Original) The method according to claim 75, wherein the third predetermined instants, for initiating termination of the measurement of the plurality of signals, are substantially identical to each other.

83. (NEW) A method of controlling the actual value of the rotation frequency of a motor having a digital rotation frequency controller associated therewith so that said motor will run at a target rotation frequency having a predetermined mathematical relationship to a target frequency supplied to said controller, comprising:

proving a rotation frequency signal and a target frequency signal;

using an identical time standard, repeatedly executing, in an arbitrary sequence, the following two steps:

measuring the length of a first time segment by measuring a time interval between edges of the rotation frequency signal and obtaining, from the rotation frequency signal and the measured length of the first time segment, a first numerical value characterizing the actual rotation frequency of the motor;

measuring the length of a second time segment by measuring a time interval between edges of the target frequency signal and obtaining, from the target frequency signal and the measured length of the second time segment, a second numerical value characterizing the frequency of the target frequency signal;

followed by the step of:

by means of said first and second numerical values, controlling, using the digital frequency controller, the rotation frequency of the motor toward said target rotation frequency having a predetermined mathematical relationship to said supplied target frequency.

84. (NEW) The method according to claim 82, of determining a numerical value for the frequency of a frequency signal which, at a constant frequency, comprises a fixed number of events per unit time, said events being selected from the group consisting of signal pulses and signal edges,

comprising the steps of:

a) at a first predetermined instant, initiating measurement of a frequency datum;

b) ascertaining a second instant, at which an event of the frequency signal subsequent to the first predetermined instant occurs;

c) counting the number of events of the frequency signal subsequent to the second instant;

d) at a third predetermined instant, initiating termination of measurement of the frequency datum;

e) ascertaining a fourth instant, at which an event of the frequency signal subsequent to the third predetermined instant occurs; and

f) calculating the numerical value from the time interval between the second instant and fourth instant, and from the number of events of the frequency signal counted between said instants.

85. (NEW) The method according to claim 84, wherein

said step of ascertaining the fourth instant comprises using the next event of the frequency signal as the event subsequent to the third predetermined instant.

86.(NEW) The method according to claim 84, further comprising, for ascertaining the fourth instant, selecting, as the event subsequent to the third predetermined instant, that next event of the frequency signal at which the number of events since the second instant is equal to a product a * N, where a and N are whole numbers, of which one is equal to at least 1 and the other is equal to at least 2.

87. (NEW) The method according to claim 86, wherein, in the case of a rotation speed frequency signal (f), the number N corresponds to a fixed number of events per revolution of the rotor.

88. (NEW) The method according to claim 84, further comprising continuously measuring said first and second numerical values.

89. (NEW) The method according to claim 88, wherein the first predetermined instants of successive measurements have defined time offsets (T_A); and

wherein the third predetermined instants each have a substantially constant time offset from the associated first predetermined instants.

90. (NEW) The method according to claim 89, wherein the third predetermined instant of a first measurement corresponds to the first predetermined instant of a second measurement subsequent thereto.

91. (NEW) The method according to claim 90, wherein the fourth instant of a first measurement corresponds to the second instant of a second measurement subsequent thereto.

92. (NEW) The method according to claim 84, further comprising

calculating said numerical value by dividing the number (N) of events of the frequency signal between the second and fourth instants by the time interval ($\Delta t$) between said second and fourth instants.

93. (NEW) The method according to claim 92, further comprising the step of multiplying the rotation speed datum by multiplication with a constant factor.

94. (NEW) The method according to claim 93, further comprising selecting the constant factor such that the rotation speed datum substantially corresponds to a conventional rotation speed indication.

95. (NEW) The method according to claim 92, further comprising dividing a numerator proportional to the number of pulses between the second and fourth instants by a denominator proportional to the time interval between the second and fourth instants, obtaining, as a result, an integral frequency datum and a remainder; and

using the remainder by adding it to the numerator of the subsequent measurement.

96. (NEW) The method of obtaining a numerical value concerning the rotation speed of a rotor, according to claim 84, further comprising the steps of:

a) during a first measurement period (T_M1), counting the number (N) of events of the rotation speed signal (f);

b) measuring the time duration ($\Delta t$) of the first measurement period (T_M1);

c) performing an integral division ("div") in which the number of events during the first measurement period (T_M1) is the numerator and the time duration of the first measurement period (T_M1) is the denominator, thereby obtaining a first integral rotation speed numerical value and a remainder (S372; S472); and

d) during a subsequent measurement, adding said remainder (REM_n_OLD; REM_n_s_OLD) to the numerator in a subsequent integral division forming part of said subsequent measurement.

97. (NEW) The method according to claim 96, wherein the number (N) of events prior to the integral division (S372; S472) is multiplied by a constant factor that is greater than 1, in order to obtain a result of the integral division that is large in relation to the remainder (REM_n; REM_n_s).

98. (NEW) The method according to claim 97, wherein the constant factor is a power of two ($2^h$; $2^{h\_s}$).

99. (NEW) The method according to claim 98, wherein the exponent (h; h_s) of the power of two is an adjustable variable.

100. (NEW) **(SEE TEXT ON PAGE 10 ABOVE)**